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Ethnographic and Archaeological Background of Nephrite Use

This chapter is a discussion of the ethnographical and archaeological background of the study area. The first section will be a review of the ethnolinguistic groups present in the study region, the Plateau lifestyle, and the ethnographically recorded use of nephrite. The second section will deal with the archaeological sequence of the British Columbia Plateau, the question of cultural complexity in the past, and the early development of nephrite technology in the Interior.

Ethnolinguistic Groups in the Study Area

At the time of European contact, the British Columbia Plateau cultural sub-area was occupied by Interior Salish and Athapaskan speaking groups (Figure 3.1). In the south, the ethno-linguistic groups were the Interior Salish speaking Lillooet (Slt'átl'imx), Okanagan, Shuswap (Secwepemc) and Thompson (Nlha7kápmx) (Teit 1900; 1906; 1909a; 1930). To the north, the Athapaskan speaking Carrier and Chilcotin groups resided (Morice 1893; Teit 1909b). One group of Athapaskans lived in the Nicola Valley but became extinct shortly after contact (Bouchard and Kennedy 1978). The Sekani (Athapaskan) and Kutenai (isolate) occupied the border region to the north and east respectively. The Lower Fraser Valley was occupied at contact by the Stolo who speak a Salish dialect related to other coastal languages (Duff 1952). Across the international border, the Columbia Plateau was occupied by Interior Salishan and Sahaptian speakers (Hunn 1990).

Plateau Lifestyle

The lifestyle of the ethnographic groups in the British Columbia Plateau sub-area was focused around the exploitation of anadromous salmon and semi-sedentary use of pit house villages (Teit 1900, 1906, 1909a,b, 1930). Annual runs of anadromous salmon provided a reliable food source for most areas of the Plateau (Kew 1992), except for local areas where geographical features hindered annual spawn-

ing runs (e.g., the upper Similkameen River). Other major food resources utilized ethnographically included land mammals and plants. Mule deer comprised the most important terrestrial faunal resource (Romanoff 1992:471) and other animals such as bighorn sheep, white tailed deer, caribou, moose and bears were also hunted (Teit 1900:230, 1906:225, 1909:513). Plant resources that were gathered included an abundant array of roots and berries (Teit 1900:231, 1906:222-3, 1909a:514-5).

Cultural Complexity on the Plateau

Hayden et al. (1985) and Hayden (1992) have conjectured that many of the ethnographically recorded aboriginal groups of the British Columbia Plateau were probably non-egalitarian, complex hunter-gatherers. This is contrary to the traditionally held belief that Plateau societies were generally egalitarian, pacifistic societies (Ray 1939:21). Based on a review of Teit's (1900; 1906; 1909b) ethnographic work, Hayden (1992) and Hayden et al. (1985:186-7) point to indicators of social complexity:

1. the presence of several classes of individuals, including hereditary leadership positions: chiefs' descendants, freemen, and a slave class (Teit 1906:254, 1909:576);
2. the exclusive ownership by leaders of important economic resources such as salmon fishing locations (Teit 1900:293-294, 1906:255-256);
3. participation in warfare and the presence of palisaded villages (Fraser 1960:82, Teit 1906:326, 243). This level of conflict indicates a pronounced degree of competition usually associated with competitive, stratified societies;
4. the significant volume and importance of trade (Teit 1900:258-262, 1906:231-233, 1909:576,583);
5. clan economic organization, in which resources were often owned by the clan, with the clan head, or "chief," administering the resources. To emphasize their ownership, clans often erected carved crest poles at places

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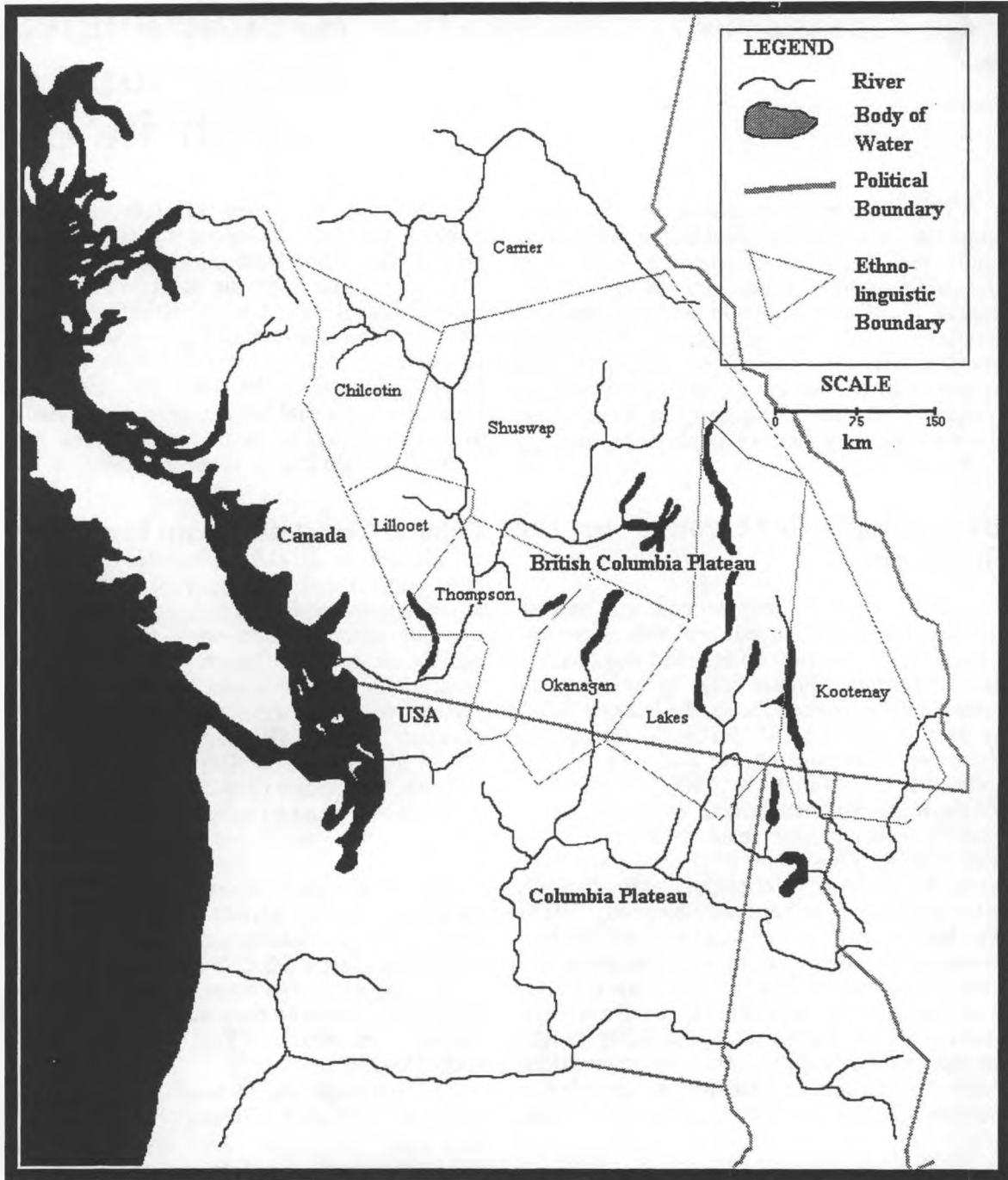


Figure 3.1. Ethnolinguistic Divisions on the British Columbia Plateau (after Richards and Rousseau 1987:2).

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such as fishing stations (Teit 1906:255-256, 1909:576);

6. the presence of a competitive feasting complex resembling the potlatch (Teit 1900:297, 1906:255, 1909:583)

7. some specialization between hunters and fishermen (Teit 1900:295)
(Cited from Hayden et al. 1985:186-187)

In addition to these indicators, there were also high population densities and semi-sedentary communities typical of complex hunter-gatherers. Patterns of social complexity were predominately focused in areas where salmon resources were abundant and easily exploited and defended (Hayden et al. 1985:196; Hayden 1992). Within these areas the Lillooet, Thompson, Okanagan and Shuswap resided. It is apparent, however, that economic distinctions were present between different local bands in these groups. Among the Shuswap, local bands in certain areas were poorer than others because of limited access to trade routes and less abundant food resources (Teit 1909a:470-471; Hayden et al. 1985:168) conclude that the egalitarian labels assigned to Plateau societies were probably products of the diffusionist culture change model, and from changes in Plateau society related to European contact.

Ethnographic Use of Nephrite

The amount of ethnographic data bearing on the use of nephrite on the British Columbia Plateau is insubstantial when compared to the Maori in New Zealand (Chapman 1892; Beck 1970). Although Plateau informants from the turn of the century remembered earlier use of jade implements, no European ethnographers actually observed the nephrite manufacturing process in British Columbia (Dawson 1887; Emmons 1923; Hill-Tout 1905; Smith 1899, 1900; Teit 1900, 1906, 1909a,b). It has been speculated by Emmons (1923:20) that European trade goods, "particularly iron, . . . put an end to the laborious manufacture of edged tools made of jade." The unfortunate result of this technological loss is that there is only limited information on procurement and manufacturing procedures in the Northwest. This includes remembered details concerning ownership, trade and use.

The following section deals with the ethnographically recorded information surrounding the use of nephrite on the British Columbia

Plateau. Topics to be discussed include the gathering of nephrite, the types of artifacts made out of nephrite, the aboriginal techniques used to grind nephrite and the utilization of nephrite implements. The section on the utilization of nephrite will specifically address the requirements of the Plateau woodworking industry, the trade of nephrite artifacts and the possible use of nephrite artifacts as wealth or prestige objects.

Nephrite Procurement

References to nephrite procurement in the ethnographic record are very general and only point to broad areas along the Fraser and Thompson rivers as sources for the material (Dawson 1887:2; Emmons 1923:14; Smith 1899:133). These inferences, however, were not based on information from informants and relate more to the recorders' personal observations and experiences. As Smith (1899:133) put it, "tons of green stones were seen along the Fraser and Thompson Rivers . . ." Modern research on jade in the interior (Leaming 1978) does not point to any *in situ* deposits in the Thompson River drainage. The nephrite deposits alluded to by the ethnographers may possibly be serpentine. As will be discussed in a future section, the archaeological evidence points to most nephrite manufacturing occurring in the Fraser River area and not along the Thompson River.

It is obvious from the types of the nephrite artifacts found in the Interior that alluvial pebbles and cobbles were utilized as blanks or cores. This is attested to by the numerous partially sawn boulders that have been recovered along the Fraser (see Smith 1899; Emmons 1923). Although no direct ethnographic references exist, Alexander (1992:161) speculates that nephrite could have been gathered during slack times encountered during fishing activities in July and August. Coinciding with the time of fishing activities, water levels in the Fraser River were at their lowest during the season which would have facilitated gathering of alluvial cobbles of nephrite from gravel bars and river banks (Fladmark 1996:personal communication).

It has been suggested that ownership of certain fishing stations could have possibly transferred to other riverine resources like nephrite (Barbara Winter 1993:personal communication). Although an intriguing possibility, ownership may have been restricted to owned productive fishing rocks (Romanoff

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1992:242). Such locations were favorable for the taking of spring salmon and were usually owned by 'rich men' in Lillooet society (Romanoff 1992:246). The lower ranking members of the community were not denied access to the larger runs of pink salmon. Public areas of the river were even open to members of different ethno-linguistic affiliation in some instances (Romanoff 1992:245; Kennedy and Bouchard 1992:314-316). In this situation anyone would have access to whatever nephrite resources existed in the area. Other fishing areas were, however, controlled by residence groups (Romanoff 1992:245; Kennedy and Bouchard 1992:308). It is possible that nephrite deposits would have been exclusive in such locations because of active efforts to limit the access of other groups. However, the value of nephrite does not lie solely in its unaltered form, and access to 'raw' nephrite, while important, was only a small part of the final value of finished jade artifacts.

Nephrite Manufacturing

The best account of how nephrite was shaped comes from Emmons (1923:22-24). As he describes:

The cut boulders [*sic*] are the most interesting, and the great number of sandstone saws found with these definitely show the process of working them. The heavier, thicker, more irregularly shaped boulders were sawed longitudinally in parallel grooves, two or three inches deep, In one of the grooves a wedge was fitted in such a way that, when sharply struck the impact bore on the entire length of the surface with equal pressure, resulting in a lengthwise cleavage

The initial cutting was accomplished by the means of a sharp silicious sandstone, and water. These saws were of varying length up to twelve or more inches, but being brittle they are generally found in smaller, broken pieces. They were three or four inches wide and from a quarter to half an inch in thickness. The cutting edge was sharpened, but it became rounded. Some saws were double-edged. The striation along the grooves of the cut boulders is complementary with the gritty particles of the saws. It has been stated or suggested that the smooth surface to be cut was first scratched or roughened with a quartz crystal to give the saw a 'hold' This may be

questioned, for, in an examination of several incipient grooves, they show the width of the saw and no fine scratches such as the point of a crystal would make

Flat, thin boulders were cut by scoring a deep groove in each face, and broken apart by a sharp blow or with a wedge driven in the groove. After separation, sections were shaped and worked with grindstones of sharp sandstone, and water; these stones, so far as could be determined, were finer in texture than the saws.

Although Emmon's (1923:22-24) synopsis cited above was partially constructed from his experience with artifactual remains, other descriptions support his claims. Teit (1900:183) reports in his Thompson ethnography that "Jade and serpentine boulders [*sic*] were cut by means of gritstones and beaver teeth." In his subsequent Shuswap and Lillooet ethnographies, Teit (1906:203; 1909a:473) states that hard stones were cut using quartz and agate crystals and that "files for cutting and smoothing stone implements, [were made] of coarse-grained sandstone and also of a dark-colored stone." (1906:203) Hill-Tout (1978:61) also records that quartz and agate crystals were used in conjunction with water to cut boulders of nephrite and emphasizes that he believes that they were the prime means by which jade was cut. From his informant Chief Michelle, Hill-Tout reports that a device consisting of two rigid, parallel strips of wood were mounted above a nephrite cobble to guide the crystal during the initial stages of reduction. Both Smith (1900:416) and Emmons (1923), as mentioned above, doubt that crystals and beaver teeth were used during nephrite manufacturing. Smith (1900:416) attributes the use of such crystals, and the beaver teeth that Teit(1900:183) reports, to the reduction of softer stones such as steatite (soapstone).

An alternate method for reducing nephrite was postulated by George Dawson (1887:5). He records that:

A suitable fragment having been discovered, it has evidently been carefully sawn up into pieces of the required shape and size, the sawing having been effected either by means of a thong or a thin piece of wood, in conjunction with sharp sand (Dawson 1887:5).

One of Smith's (1900:416) informants, Michel

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of Lytton, gave a similar account by stating that horsetail rush was used to start grooves in boulders. Smith (1899:1900:416) ultimately discredited both Dawson and his informant by claiming that the 'character' of the concave grooves in the sawn boulders he observed would not support the use of a string or reed with sand. From my experience, however, there are instances where concave grooves exist in sawn boulders that would be unlikely to result from the use of a stone saw. It is probable that both techniques were used in situations where the need arose and perhaps where suitable materials (such as corundum or garnet bearing sands) were available, or where sandstone was scarce. It is also not beyond the realm of possibilities that quartz or agate crystals were used at some point during the cutting process as reported by Hill-Tout (1978:61-62).

There is relatively little information as to which members of Plateau society performed the task of making nephrite artifacts. There are no direct indications that nephrite manufacturing was a specialized craft among any Plateau group. It may be surmised that members of the community who worked more with wood may have used nephrite tools more than others. As will be discussed, however, not all nephrite implements may have been for woodworking purposes and the main users may not have been the manufacturers of the nephrite tools. By its very nature, jade working is a monotonous and laborious task that does not require the dexterity demanded by a chipped stone industry. Almost anyone, including children, could provide the locomotion necessary to cut jade. An underlying knowledge of the principles behind grinding rocks, however, would be needed in order for any effectual rates of reduction to be achieved. If specialization in nephrite cutting did exist, it would probably have been in the knowledge of the best types of sandstone and abrasives to use for saws and grit. Teit (1900:182) does record that some specialization did occur on an individual basis between different manufacturing tasks. It is thus very probable that some members of Plateau society had more knowledge of the principles of jade working than others.

It appears that ethnographically men were probably the primary jade workers in Plateau society. As Teit (1900:182) records for the Thompson, most of the stone manufacturing was performed by men. In addition, one of Emmons' (1923:20-21) informants stated that his father made a particular celt that he was

selling. Although by no means conclusive, these are the only gender related references to nephrite manufacturing. Female activities were traditionally more clustered around basketry, hide preparation and matting, according to Teit (1900:182), and sexual divisions of labor were present in other areas of plateau lifestyle.

Neither the locations where nephrite artifacts were primarily manufactured, nor the time or times of year in which the activity took place are alluded to in the ethnographies. In terms of location, an area with access to water, sand, and grinding stones would be preferable. In New Zealand, for example, the Maori had specific workshop areas on beaches and river mouths that were permanently set up with grinding stones of varying coarseness (Chapman 1892:501; Beck 1970:70-77). Those locations were utilized at various times during the Maori seasonal round and all materials related to the greenstone industry were imported, sometimes from great distances, into the site. Although the nephrite industry in British Columbia never reached the same magnitude as the Maori greenstone trade, it is possible that similar preferred manufacturing areas were used on the Plateau. One such area could have been along the Fraser River where the nephrite was gathered. This, however, may not have been the case because of the intensive nature of critical subsistence activities during the seasonal round.

As Alexander (1992:161) speculates about summertime nephrite gathering, manufacturing could have taken place in the Fraser Canyon during mid-July to late August. When examining the subsistence activities occurring at the time, however, salmon procurement would have probably consumed the majority of available time. In addition, it was a time of social interaction and trade with other groups (Alexander 1992:168). When looking at the seasonal round as a whole, the most likely period when excess time would have been available from subsistence activities, was during the winter occupation of pithouse villages. At this time, people mainly subsisted on stored salmon supplies (Teit 1900, 1906, 1909; Alexander 1992:165) and the surplus time needed to cut or finish nephrite would have possibly been available if provisions were good. The winter village often served as a base camp for other seasonal resource storage and it is possible that the appropriate materials for nephrite working would have been brought into the camp. How-

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ever, it may have been more practical to grind nephrite near the river due to the size of the boulders being cut. As one cubic foot of nephrite (0.255 m³) weighs 186 pounds (83.7 kg) (Leaming 1978:7), it would possibly be more realistic to work nephrite down by the river rather than hauling the material up the river terrace. Because water would be available year round in such locations, nephrite manufacturing may still have been performed in the winter months. Emmons (1923) does report observing sawn boulders alongside the Fraser River.

Types of Artifacts made of Nephrite

The most common artifact type made of nephrite on the British Columbia Plateau is the celt. The term celt, as defined by Kapches (1979:65), "refers to a class of ground stone implements that includes the functional and morphological types of artifacts known variously as adzes, axes, gouges, chisels, etc. . . ." The term celt does not refer to ground stone implements used as obvious ritual items, or other forms of ground stone tools (knives, projectile points) (Kapches 1979:65).

Ethnographers report celts of all types to have been made by Interior groups, including adzes, chisels, skin smoothers/scrapers and axes (Emmons 1923:24-31; Teit 1900:183, 1906:203, 1909:473, 1930:217). Teit (cited in Emmons 1923:26) and Emmons (1923:24-31) point to three sizes of celts. The largest of these ranged from 15 to 45 centimeters in length, were straight or tapered slightly from bit to pole, and were finely crafted (Emmons 1923:24-25). At times they were double bitted and usually do not exhibit wear. The second type range in size from 10 to 12.5 cm, were proportionately broader, tapered slightly and could be rough in form (Emmons 1923:27). The third type was essentially a small chisel-sized celt. According to Teit (cited in Emmons 1923:24), Interior Salish in the Lytton area referred to any adze or celt as *xoisten* and if made of jade or greenstone, *sokalä'ist tek xoisten*. The large celts were referred to as *steüu sokalä'ist* and chisels were called *manāu* or *sokalä'ist tek manāu* if made of jade (Teit in Emmons 1923:31).

Other types of artifacts made of nephrite include knives, drill-points, hammerstones, pestles, clubs and possibly war picks (Emmons 1923:31-36; Teit 1909a:473). It should be noted that there are no manufacturing references to any other artifact types except celts.

Interestingly, very few, if any ornamental objects were made out of nephrite on the British Columbia plateau. Ainsworth (1956:11) reports a dubious find of a human head carved from nephrite that was recovered by an individual panning for gold near Spuzzum. From artifacts I (or other authors) have observed, there is no evidence that interior jade items were created in any forms other than utilitarian shapes. Only one possible exception to this comes from the Keatley Creek site where a small polished fragment of nephrite was recovered. This fragment is not from a celt and may be a tip of a knife or possibly from some form of ornament. Utilitarian celt forms could be highly exaggerated in size and thus virtually non-functional. Clearly the larger celts do represent an elaboration of the nephrite industry. The levels to which this evolution proceeded, however, did not seem to extend to the ornamental objects seen in other jade working cultures like the Maori, Chinese, and Mesoamerican groups.

Use of Nephrite Implements

Nephrite is usually thought of synonymously with prehistoric woodworking on the British Columbia Coast and Plateau. While this assumption is not without merit, on the British Columbia Plateau there are ethnographic passages that indicate certain nephrite artifacts were specifically manufactured for alternate purposes. Therefore, the following section will be a discussion of Plateau woodworking and the other uses of nephrite artifacts.

Woodworking. The ethnographic woodworking kit on the British Columbia Plateau included a number of different types of adzes, chisels, hand mauls, bone and antler wedges, stone drills, beaver tooth knives and chisels, and chipped stone knives (Teit 1900:183, 1906:203-204, 1909a:474). Nephrite artifacts may have constituted an important part of this kit. As recorded by Teit (1900:183), "adzes and axes of jade and serpentine were in common use" for woodworking purposes. The types of hafts used for celts include elbow adze handles, D-Shaped handles (Teit 1900: 183, 1906:204), bone or wood straight handles (Emmons 1923:29; Teit 1906:204), and possibly axe type mounts (Emmons 1923:27). Along with the larger celts, chisels, and possibly knives of jade, were also used for woodworking (Teit 1900:183, 1906:204; Emmons 1923:28-31).

The pervasiveness of the woodworking industry in the ethnographic record for the Brit-

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Table 3.1 Woodworking tasks on the Plateau as recorded in Teit (1900,1906, 1909a).

Utilitarian	Ceremonial
<p>pithouse construction and associated structures (sweat lodges, women's huts) (1900:192-196) mat lodge poles (1900:213) household furnishings (ladders, bowls, beds) (1900:204, 1906:217) fishing weirs and platforms (1900:254; 1906:227) drying and/or storage racks (1900:199; 1906:229) deer fence construction(1900:247) canoe hollowing (1900:183) hunting equipment (bows, arrows, spears, nets, snowshoes, etc. . . .) (1900:239-43, 250-1, 257) firewood procurement (1909:709, 715)</p>	<p>totem/crest carving (1906:217,493) grave pole/statue/marker carvings (1906:272, 1900:335-6) grave boxes (1906:272; 1900:128-9) ladder carvings (1900:194; 1909:492-3) interior post carving grave fences (1900:334)</p>

ish Columbia plateau is substantially less than that recorded for the Coast (e.g., Boas 1966; Drucker 1955). However, woodworking was still an important activity in Plateau culture. In Table 3.1 is a list of some of the woodworking tasks on the Plateau. The use of adzes are mentioned in several instances. During the construction of pithouses the timbers used in the structure were shaped using stone adzes, wedges, and hammers (Teit 1900:192). Stone adzes were also mounted in elbow handles and used for hollowing canoes. It is quite probable that adzes were used for other tasks but these uses were not explicitly stated. It is not clear, however, whether nephrite adzes or celts were the only heavy duty wood cutting tools. There are references to the use of alternate tool types to perform other kinds of heavy duty woodworking tasks. Those included antler wedges or chisels to split firewood (Teit 1909:709, 1917:29) and fall trees (Teit 1909:709,715). It is possible that most basic woodworking tasks could be performed without sharp stone edges - especially groundstone edges.

Property Items. As mentioned earlier in the artifact section, a long form of celt was manufactured on the British Columbia plateau. This type of celt was apparently non-utilitarian and was manufactured strictly for wealth purposes.

Teit recorded the following:

The long celt was not hafted as a common adze, and it seems that at least most of them were not used as tools at all. You will notice that many of them, at least, have no properly prepared end on which to strike, this end being sometimes more or less convex, sometimes irregular in outline, and generally more or less narrow and thin; also some of these long celts were double-bitted. All this would seem to show these celts were not intended as a rule to be used as chisels, adzes, or wedges. According to the old Indians these long celts were "property", and good ones exchanged for considerable value. Some of them were occasionally used as chisels or wedges, in some cases being held, it seems, in the hand, and struck with hardwood mallets. The Indians aver, however, that generally speaking they were not made for any special use as tools. Occasionally they were also used in the hand for rubbing skins, but it seems their use for this was also rare. More often they were used as weapons, being hafted as tomahawks across the end of a wooden handle, in which they were inserted or set. It is said, however, that they were not made especially for this purpose, but were "property," or works of art, as it were, exchanging for high values (cited in Emmons 1923:26-7).

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Other smaller sizes of nephrite celts did not have the same value and were definitely intended for woodworking purposes (Emmons 1928:28-31). It is not clear if other types of nephrite artifacts, such as knives, were valued in a similar manner as the large celts.

The exact 'value' that was placed upon long celts by Plateau groups is not explicitly stated by Teit or Emmons. However, in the northwestern British Columbia/ Alaska region, the Tlingit would trade one to three slaves for a jade adze blade merely two to three inches in size (Emmons 1923:18). Although obviously no direct contact between the Tlingit and Interior Plateau existed, the demand for jade on the southern coast was equally as high. Unfortunately, there is no further mention of what other types of items were exchanged for nephrite. Both the Lillooet (Teit 1906:231) and the Thompson (1900:259) had historic trade routes with coastal groups that probably included the exchange of nephrite in the past. Nephrite exchanged in this system would almost certainly generate a high return.

Warfare. Warfare was endemic in Plateau society and was possibly used as a mechanism to procure sufficient food in times of famine (Cannon 1992:509-511). Jade items are specifically mentioned as some of the artifacts used during conflict. As mentioned in Emmons (1923:26-7), some of the longer celts were possibly hafted as tomahawks and used in warfare by Plateau groups. This is also reiterated in Teit's (1906:234) Lillooet ethnography, where he records, "A kind of tomahawk was made by firmly lashing a jade or serpentine celt, . . . , to the end of a short wooden handle." These 'tomahawks' could also have been smaller celts with rounded bits (skin scrapers) instead of the large celts (Teit 1900:234; Emmons 1923:plt. VII). Besides this weapon, clubs and daggers made of nephrite were also possibly used (Teit 1909b:473, 1930:256; Emmons 1924:plt.VII).

Larger raids on the plateau were led by a war-chief (Teit 1900:267,1909:543). Such men usually achieved their position through their exploits and often were responsible for dividing 'booty' after raids. Such successful war chiefs could have possessed special weapons made of jade. This would be similar to high status Maori individuals who employed the *mere*, a jade club/short sword (Chapman 1892:505). Such weapons took months of labor to complete and were only possessed by Maori chiefs or head-men. A similar situation

is also present for ethnographically recorded axe use in New Guinea (Phillips 1975). Here, nephrite celts were mounted in elaborate ceremonial fashions that would have precluded their use for utilitarian tools.

Ceremonial Usage. There are only two ethnographic passages that relate to the ceremonial use of jade objects and they are rather vague. One reference comes from the boy's puberty ceremony amongst the Thompson where Teit (1900:320) reports the use of a jade celt during the performance of ritualistic gymnastics. As he records:

He made holes in rocks or boulders [*sic*] with a jadeite adze, which was held in the hand. Every night he worked at these until the holes were two or three inches deep. When making them he prayed, "May I have strength of arm; may my arm never get tired - from thee, O Stone!" This was believed to make the arm tireless and the hand dextrous in making stone implements of any kind. (Teit 1900:320)

The second reference comes from Thompson mythology. In this passage, a number of mythological characters try to make Raven jealous by adorning her sister with a necklace and "a finely polished celt of green stone (jade) to hang at her belt" (Teit 1912:88).

It is obvious that direct correlations or meanings cannot be taken out of these two passages. One is based in mythology and the other is a rather unbelievable practice (i.e., possible waste of a valuable implement). What can be brought out of these passages, however, is that probably some ceremonial or prestige value was given to some nephrite implements. This admiration derives from of the strength that jade possesses and the aesthetic or wealth value of jade.

Other Uses. Other uses of nephrite in the interior are reflected in the names of the artifacts. These include use as skin scrapers, pestles, and hammerstones (Emmons 1923:24-31; Teit 1900:183,1906:203,1909:473,1930:217). As Teit (cited in Emmons 1923:27) stated above, even the large celts may have been used for rubbing and processing skins. The usual artifact associated with this task, however, is a blunt form of celt that has a smooth, rounded bit (Emmons 1923:28; Teit 1906:203). The strength of nephrite makes it an excellent material for both pestles and hammerstones and this probably accounts for its use as such.

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Trade of Nephrite Implements. Well-developed trade networks were present on the British Columbia plateau during the post-contact period (Teit 1900, 1906, 1909a,b, 1930). These trade routes connected the Lillooet, Thompson, Shuswap, Okanagan, and Chilcotin with Coastal groups, the Carrier to the north, the Kutenai and Lakes Salish to the east in the Rockies and to other Plateau groups in Washington. Items traded include dentalium shells, dried salmon, salmon oil, buckskin clothing, copper, slaves, skins, berries, bark, goat and dog hair, beads, mats, baskets, and other materials. At one time this trade may have included nephrite. There are no direct references to nephrite being exchanged, but one passage from Teit's (1930:253) Okanagan ethnography states that stone celts were obtained from the Thompson. The material that the celts were made of, however, was not listed. Teit (1930:256) also indicates that stone clubs, possibly of jade or serpentine, were obtained from southern groups in Washington. The merits of this claim, however, are unknown. As will be discussed in following sections, nephrite was traded from the Fraser Valley archaeologically.

Summary of Ethnographic Nephrite Use

Ethnographically recorded use of nephrite can be summarized as follows:

1. Nephrite used by prehistoric interior societies came from the Fraser Valley, but no specific areas were identified.

2. The manufacture of nephrite celts was performed by creating deep grooves in a boulder or cobble with either sandstone saws, reeds, wooden rods, or thongs of leather in conjunction with sand and water. Quartz crystals were possibly used to start these grooves. Abrading stones and files of sandstone were also used during the shaping process. Once the desired width of celt was roughed out, it was snapped out of the boulder either by the use of wedges or blows from a hammerstone.

3. The places of manufacture, or the times of year that nephrite artifacts were made, are not recorded. The nature of other activities during the seasonal round would suggest that the gathering of nephrite possibly occurred in the summer and that manufacturing or finishing perhaps ensued during the winter.

4. Artifacts made of nephrite include celts, chisels, knives, hammerstones, pestles, clubs and drills. No definite ornamental artifacts of nephrite were made. At least three dif-

ferent sizes or types of celts were manufactured.

5. Small and medium sized celts were used predominantly for woodworking.

6. An exaggerated elongated form of celt was produced specifically for non-utilitarian use as a "property" or wealth item and was highly valued. The extent of this value, however, is poorly defined.

7. Some nephrite artifacts were possibly used as weapons in warfare.

8. There are limited references to nephrite being used in ritual. Two references that do exist suggest the placement of high value upon nephrite celts.

9. There is some very limited ethnographic evidence that nephrite celts were traded. There are no direct references to actual exchange values.

What is really lacking from the ethnographic record are specific indications of which individuals or groups in Plateau society made, owned and used nephrite artifacts. The record does suggest that high ranking individuals had distinctions in their clothing and material possessions that set them apart from lower ranked members of the community (Teit 1900: 206-222). Nephrite, however, by the time that ethnographic studies were undertaken was not specifically mentioned as a possession of wealthy or high ranked individuals. On the other hand, it is also not an item that was overtly recorded to be owned by all members of society.

The reliability of some of those ethnographic impressions has to be questioned due to the prior loss of nephrite technology. A problem with the recorded ethnographic information is that it is partially an interpretation derived from of the archaeological record rather than a direct observation of living Interior cultures. Teit, Emmons, Dawson, Hill-Tout, and Smith all partially based their study of nephrite on artifacts they recovered from archaeological sites and did not observe any manufacturing. When posing questions to their informants, they would have had to refer to those archaeological specimens. Herein lies a problem because it is probable that those informants only had limited experience with nephrite in their childhood (if any at all), although at least one stated that his father had made a nephrite adze and presumably could have observed its manufacture and use. As with other humans, they would have naturally filled in gaps in their knowledge with their own interpretations

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(Leone 1982). This is compounded by a similar situation pertaining to the ethnographers themselves who could also have interpreted those artifacts based on their knowledge of jade working in other areas of the world. Unfortunately, it is now difficult to determine what portion of the "ethnographic" record was reconstructed and what was actually remembered.

However, the ethnographers and their informants were both closer in time to the subject than we are currently. The informants, because of their direct cultural affinities and possible contact with the technology, had a more 'emic' position and were thus most likely to understand how their culture had used and made such items in the past. One cannot ignore the use of ethnographic analogy because it provides us a starting point from which to interpret the past. However, in using the ethnographic information on nephrite use from the interior of British Columbia, one must exercise caution to avoid constraining the data into an already biased model.

British Columbia Plateau Prehistory

Fladmark (1982:124-131) divided the prehistory of interior British Columbia into three periods: Early (>8000 BP), Middle (8000-3000 BP) and Late (3500/3000-present). No major published revisions of this sequence exist and only the Late Period has received modifications. Richards and Rousseau (1987) have revised the chronology of the Late Period by extending its initial dates to 4000/3500 BP.

The Early Period (>8000 BP)

Relatively little is known about cultural occupations of the early period and most information comes from scattered Early Prehistoric projectile point finds (Fladmark 1982:125). Only one excavated site from the time period exists in the Interior (the Gore Creek Burial) and it consists of one unfortunate individual who was mired in a flash-flood or mudflow at 8340 ± 115 BP (Cybulski et al. 1981). No artifacts were found in association. Other sites relating to the Early Period are only found in areas peripheral to the Plateau on the Coast, e.g., Namu (Hester and Nelson 1978); in the northern Interior e.g., Charlie Lake Cave (Fladmark et al. 1984) and in the Rocky Mountains e.g., the Vermillion Lakes Site (Fedje et

al. 1995). The paucity of data available for the British Columbia Plateau area makes it difficult to make any evaluation of the Early Prehistoric in the Interior (Fladmark 1982:126).

The Middle Period (8000-3500 BP)

Substantially more is known about the Middle Period, although only a limited number of sites from the time period have been excavated. Those include the Oregon Jack Creek site (EdRi 6) (Rousseau and Richards 1988), the Lochnore-Nesikep sites (Sanger 1970), the Rattle Snake Hill site (Lawhead and Stryd 1986), the Terrace site (EeRl 171) (Richards 1978), and some of the sites in the Highland Valley (EcRg 1b, EdRg 2) (Lawhead and Stryd 1986). These sites suggest that Middle Period cultures were small, loosely organized groups that primarily exploited terrestrial animal populations (Sanger 1970; Kuijt 1989). There does not appear to be the same dependence on anadromous salmon resources as seen in the Late Prehistoric (Kuijt 1989:109-110), although the faunal evidence is very meager for such conclusions. The tool kits associated with the Middle Period were primarily of flaked stone and in many sites there was the presence of a developed microblade technology (Fladmark 1982:126-129). No manufacturing or use of nephrite is known to have occurred during this time period.

The Late Period (4000/3500 - 200BP)

The Late Period is marked by the development of the Plateau Pithouse tradition between 4000/3500 BP on the British Columbia plateau. As defined by Richards and Rousseau (1987:21):

... the *Plateau Pithouse tradition*, [is] a cultural tradition characterized by semi-sedentary, pithouse dwelling, hunter-gatherer, logistically organized (Binford 1980), band-level societies that relied heavily on anadromous fish for subsistence.

Within the tradition, three cultural horizons exist: the Shuswap (4000/3500-2400 BP), the Plateau (2400-1200 BP) and the Kamloops (1200-200 BP) horizons. Although there are differences between the horizons, many similarities exist:

1. use of pithouses as winter dwellings;
2. use of earth cellars as food storage facilities and a hypothesized reliance on stored

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food in winter;

3. hypothesized semi-sedentary settlement pattern involving permanent winter settlements, and short-term non-winter resource extraction and/or processing camps and stations;

4. reliance on anadromous salmon as the primary food, supplemented by large and small land mammals, fresh water fish and mussels, birds, and wild plant resources;

5. use of earth ovens at pithouse sites for baking and roasting;

6. use of a heavy-duty woodworking tool kit consisting of *nephrite adzes*, bone and antler wedges, and large hammerstones or hand mauls;

7. a sophisticated bone and antler fishing technology;

8. emphasis on chipped stone tools;

9. limited use of ground stone tools;

10. anthropomorphic and zoomorphic carving in stone;

11. hypothesized wood and plant fiber industry . . . ;

12. use of stone boiling technique for cooking . . . ;

13. exchange with Northwest Coast cultures involving *nephrite* and *steatite* going to the Coast, with marine shells being traded to the Interior. (Cited from Richards and Rousseau 1987:50-51, emphasis added)

The adoption of the Plateau Pithouse tradition on the British Columbia Plateau has been speculated to have occurred as an adaptive response to climatic change (Fladmark 1982:135; Kuijt 1989 105; Richards and Rousseau 1987:22-23,52). During this time annual salmon migrations stabilized due to hydrological changes (Fladmark 1975) and ungulate grazing areas diminished due to forest expansion (Richards and Rousseau 1987:23; Kuijt 1989:105). Although originally speculated to be a northern innovation (Nelson 1973; Stryd 1973), from radiocarbon evidence it appears that pithouse use spread up from the south (Ames and Marshall 1980:37). The earliest pithouses in the Pacific Northwest are found in northeastern California (O'Connell 1975:33 cited in Ames and Marshall 1980:35) and on the southeastern Columbia Plateau (Ames and Marshall 1980:35). Recent excavations in British Columbia reveal, however, that the house-pit may have been on the British Columbia Plateau by ca. 4500 BP (Wilson 1991).

Complexity in the Past

The possibility of complex hunter-gatherer groups extending into the late prehistoric archaeological record needs to be considered (Hayden et al. 1985). Stryd (1973:76-89) supported this view based on the patterns of pithouse distribution he observed in the Lillooet area. In larger housepit villages, Stryd (1973:76-82) noted the presence of exceptionally large cultural depressions (15m+) that usually had preferential locations near fresh water. This pattern he attributed to differences in family size and rank, with wealthier and larger families inhabiting the larger housepits with better resource access. In addition, the settlement pattern in the Lillooet area exhibits a hierarchical structure with larger villages interspaced with smaller housepit sites (Stryd 1973:86).

Hayden et al. (1985:190) expanded upon Stryd's (1973) assertions by postulating that Plateau groups used "primitive valuables" (Dalton 1977) seen in use by other complex hunter-gatherer groups. They also indicate that Plateau society possibly had ascribed status that could be inferred from differential burial good distribution and that it had a food resource base ample enough to fuel socioeconomic differentiation. Some work has gone into verifying these presuppositions. Hayden and Spafford (1993) have conducted a preliminary examination of the distribution of certain types of artifacts (which suggest wealth) in various sized housepits at Keatley Creek (EeR1 7). With some exceptions, the distributions of apparent wealth items were more associated with large housepit occupations than with those of medium and small sizes. It is also surmised that poorer families may have been economically attached to the residents of the larger dwellings and were employed as servants by those households (Hayden and Spafford 1993:137). Schulting's (1995) work on burial assemblages on the Fraser-Columbia plateau supports Hayden et al.'s (1985) speculations on burial patterns. Based on statistical manipulations of artifact distributions in Plateau burials, Schulting (1995) makes a convincing case for some measure of inequity being present in Plateau society, as well as possible evidence for some ascribed status.

The actual level of complexity displayed by Plateau groups is difficult to quantify. As Schulting (1995:185) points out, the complexity that Plateau societies exhibit falls along a continuum between egalitarian groups and

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rigidly stratified societies. Hayden et al. (1985:187) assert that prehistoric Plateau groups in the first millennium AD show greater complexity than ethnographically recorded groups. They feel that prehistoric occupants of large housepits on the Plateau were organized into residential corporate groups that had control over resources and trade (Hayden et al. 1985:183). However, Richards and Rousseau (1987:53) caution that large pithouses may be an adaptational or behavioral response that is not related to corporate groups.

The Prehistoric Development of the Nephrite Industry

The initial introduction of nephrite artifacts onto the Canadian plateau occurred during the mid-Shuswap horizon (Richards and Rousseau 1987:30). The earliest date associated with nephrite artifacts on the British Columbia Plateau comes from the Arrow Lakes Region at DkQm 5 (Turnbull 1977). At this site a celt was found in an occupation associated with a carbon date of 3090±200 BP. In addition to this, nephrite has been found at EeRb 10, near Kamloops, dated at 2950±50 BP (Richards and Rousseau 1982), at EfQu 3 near Shuswap Lake at 2540 BP (Sendey 1971:13; Mohs 1980), DIQv 39 in the Okanagan Valley at 2370±80 (Rousseau 1984) and at DiQm 4, in the Arrow Lakes Region again, at 2580±220 BP (Turnbull 1977). One celt is also associated at the Lochnore site (EdRk 7) with a date of 3220±90 BP (Sanger 1970:103-4), but problems connected with the radiocarbon assay has raised questions about the accuracy of this date (Richards and Rousseau 1987:11).

From the dates associated with the nephrite in this period, it would appear that nephrite technology was adopted or developed shortly after the introduction of the pithouse complex. Artifacts made of nephrite have yet to be recovered from Middle Prehistoric sites on the British Columbia Plateau (e.g., EeRh 61 and EfQq 3, Arcas Associates 1985, 1986; EeRk 1, Bussey 1994: personal communication; FgSd 1, Donahue 1977; FiRs 1, Fladmark 1974; EdRi 2 and EdRi 11 Rousseau 1988 and Rousseau et al. 1991; EdRk 4, EdRk 7 and EdRk 8, Sanger 1970; EcRg 4J, Stryd and Lawhead 1983; EdQx 41 and EdQx 42, Wilson 1991). The earliest dates associated with the Plateau Pithouse tradition suggest that it first appeared between 4000 and 3500 BP (Richards and

Rousseau 1987). The deposits at these sites (FaRm 23, FiRs1, FgSd 1, EeRb 10[earliest component]) did not provide evidence of nephrite working in the form of celts or manufacturing debris (Fladmark 1976; Donahue 1977; Richards and Rousseau 1982; Rousseau and Muir 1991).

The development of celt technology appears to have occurred virtually simultaneously along the Northwest Coast. The dates given for the initial occurrence of celts in coastal sites generally range from 4500 to 3000 BP, with 4000 BP being a rough mean (Figure 3.2). The earliest celts were either produced through pebble modification or flaked blank approaches (see Section 4.1.3) and no 'sawing' technology was used. The first instances of nephrite being used for celts occurred in the Lower Fraser River and possibly on Vancouver Island during the Charles Culture / Mayne phase. At the Pitt River site (DqRq 21), two nephrite celts were recovered in close association with two radiocarbon dates of 3750±100 BP and 4100 ±100 BP (Patenaude 1985:121). These celts are fairly crude, however, and were made on modified nephrite pebbles. Another site in the Duke Point area, DgRx 5, has nephrite celts potentially occurring between 4760±190 BP and 2600 BP (Murray 1982:128). There are, however, problems with the contexts from which the earlier carbon sample was obtained and other material culture recovered in association suggest a later affiliation (Murray 1982:128). This celt was made either on a pebble or flake of nephrite. The use of sawing techniques to manufacture celts did not occur on the Coast until the Locarno Beach Culture Type between 3200 and 2400 BP (Mitchell 1990). It is possible that the technique was the result of an evolution of ground slate technology that was present in the Charles Culture / Mayne phase (Borden 1975:95).

The start of ground stone celt technology can be linked to an increasing demand for efficient woodworking tools sparked by increasing social pressures and environmental change along the Northwest Coast. People usually evolved and developed lithic technologies based on cutting demands (Hayden 1987). With celt technology the ground edge, although requiring more effort to maintain, represents an improvement over the flaked edge because of its increased durability. Environmental conditions at the time celts appeared saw the stabilization of salmon fisheries (Fladmark 1975), the rise of mature cedar forests on the Coast

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(Hebda and Mathews 1984) and the concurrent development of the Northwest Coast lifestyle pattern. An examination of the relative similarity between the dates of initial celt development from north to the south, seems to indicate that there was a very rapid dissemination of celt technology.

Based on the radiocarbon dates associated with nephrite artifacts in the Northwestern area, it is probable that nephrite celt technology moved from the Southern Coast into the interior.

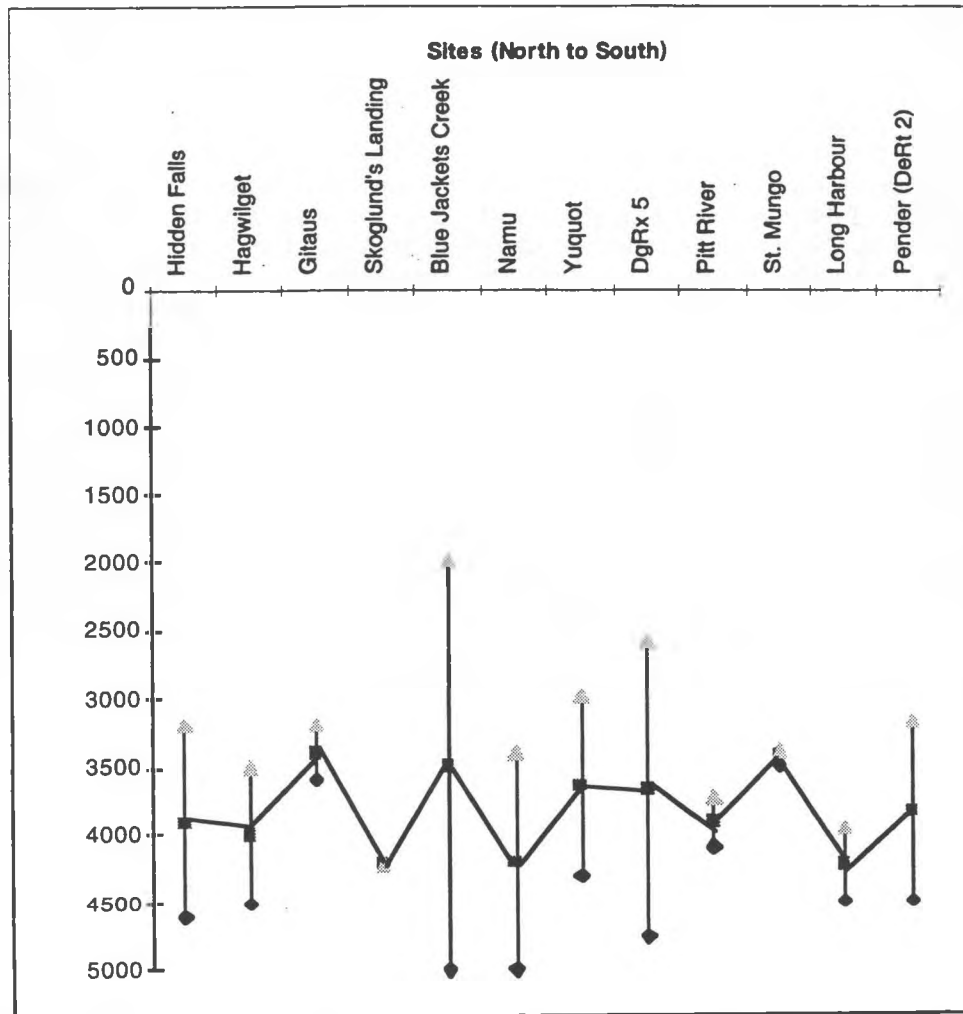


Figure 3.2. Early Celt Occurrences in the Pacific Northwest, North to South.

References: Hidden Falls (Lightfoot 1989:228-9), Hagwilget (Ames 1979:198,201), Skoglund's Landing (Fladmark 1970:32-3), Blue Jackets Creek (Severs 1974:181,191) Namu (Luebbers 1978:48-50, 56, 58), Yuquot (Dewhirst 1980:94-121), Long Harbour (Johnstone 1991:58, 122, 132b), Pender Canal (Carlson and Hobler 1993; Carlson 1994:pers. comm.), Pitt River (Patenaude 1985:121), St. Mungo (Ham et al. 1984:46-7, 114), DgRx 5 (Murray 1982:127-9)

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Both the use of nephrite and the sawing technique appear to have greater antiquity on the Southern Coast than any other area bordering the British Columbia Plateau. On the Columbia plateau, early dates associated with celt use are similar to the British Columbia plateau. Sites 45-OK-58 and 45-OK-78 in the Washington Okanagan have nephrite celts associated with dates of 3020 ± 150 BP and 2730 ± 160 BP (Grabert 1968). In addition, site 45-DO-214 has a celt placed between 4000 and 2000 BP (Miss et al. 1984a) and at site 45-OK-4 a celt was recovered in a floor deposit dated to 2097 ± 132 BP (Miss et al. 1984b).

In the northern Interior there are relatively little amounts of data because of the paucity of excavated sites. Some of the most northerly sites associated with Plateau style pithouses, like FiRs 1 (Fladmark 1976) and FgSd 1 (Donahue 1977), show no evidence of nephrite use.

The adoption, rather than the development, of the nephrite industry is also suggested in the Interior by the lack of evidence for an *in situ* evolution of celt technology. There are no evolutionary proto-types of celts, as seen on the Coast, in the Interior. The first interior celts are made on sawn blanks, which on the Southern Coast were preceded by flaked and pebble forms. It would appear from this that celt technology was already partially developed before it was adopted by Interior groups.

The adoption of jade working technology in the interior during the Shuswap Horizon was possibly a response to increased woodworking demands brought on by shifts in settlement and subsistence, as seen on the Coast. The nature of the Middle Prehistoric occupation in the Interior suggests that most Plateau groups of the time were organized into small, highly mobile groups that had a general subsistence strategy relying heavily on terrestrial mammals (Kuijt 1989). There is some evidence from Monte Creek that some sedentary activity was beginning in the interior at the time (Wilson 1991). With the changes in settlement and subsistence patterns seen in the Shuswap Horizon, it is foreseeable that woodworking demands increased. For example, the woodworking requirements needed to construct a pithouse would probably far exceed those needed for a form of mobile residence like a mat lodge. Furthermore, a greater emphasis on anadromous salmon, as hypothesized for the Shuswap Horizon (Richards and Rousseau 1987; Kuijt 1989), would require the annual construction of fishing weirs and platforms which may not have been used during the Middle Prehistoric.

More attention will be directed in subsequent sections to the evolution of the nephrite industry during the Plateau Pithouse tradition and to the context of archaeological occurrences.